

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 21

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte FERDINAND C. HAASE and  
DEAN E. CRESS

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Appeal No. 94-2279  
Application 07/687,819<sup>1</sup>

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ON BRIEF

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Before WINTERS, WILLIAM F. SMITH and WEIMAR, Administrative Patent Judges.

WILLIAM SMITH, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 from the final rejection of claims 1 through 22. Claims 23 through 73 are pending but have been withdrawn from consideration by the examiner.

Claim 1 is illustrative of the subject matter on appeal and reads as follows:

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<sup>1</sup> Application for patent filed April 19, 1991.

Appeal No. 94-2279  
Application 07/687,819

1. A composition of matter comprising at least one polypeptide of interest fused to at least one biotinylated avidin binding polypeptide, wherein the polypeptide of interest and the biotinylated avidin binding polypeptide each have a N-terminus and a C-terminus and the fusion takes place at the C-terminus of the biotinylated avidin binding polypeptide.

The references relied upon by the examiner are:

Berger, "Antibodies that Bind Biotin and Inhibit Biotin-Containing Enzymes," Methods in Enzymology, vol. 62, pp. 319-326 (1979).

Nagai et al. (Nagai), "Generation of  $\beta$ -Globin by Sequence-Specific Proteolysis of a Hybrid Protein Produced in Escherichia Coli," Nature, vol. 309, pp. 810-812 (1984).

Kohanski et al. (Kohanski), "Receptor Affinity Chromatography," Annals New York Academy of Sciences, vol. 447, pp. 373-385 (1985).

Lowenadler et al. (Lowenadler), "Production of Specific Antibodies Against Protein A Fusion Proteins," The EMBO Journal, vol. 5, pp. 2393-2398 (1986).

Murtif et al. (Murtif), "Mutagenesis Affecting the Carboxyl Terminus of the Biotinyl Subunit of Transcarboxylase," The Journal of Biological Chemistry, vol. 262, pp. 11813-11816 (1987).

Maina et al. (Maina), "An Escherichia Coli Vector to Express and Purify Foreign Proteins by Fusion to and Separation from Maltose-Binding Protein," Gene, vol. 74, pp. 365-373 (1988).

Sambrook et al. (Sambrook), "Molecular Cloning: A Laboratory Manual," Cold Spring Harbor, NY (1989).

Cronan, "Biotination of Proteins *in Vivo*," The Journal of Biological Chemistry, vol. 265, pp. 10327-10332 (1990).

Claims 1 through 15 stand rejected under 35 U.S.C. § 103 as unpatentable over Cronan in view of Maina, Nagai and Lowenadler and further in view of Murtif. Claims 1

through 15 also stand rejected under 35 U.S.C. § 103 as unpatentable over Maina in view of Murtif and further in view of Berger and Kohanski. Claims 16 through 22 stand rejected under 35 U.S.C. § 103 as unpatentable over Maina in view of Murtif and further in view of Sambrook. We reverse.

### DISCUSSION

Claim 1 is directed to at least one polypeptide of interest which is fused to at least one biotinylated avidin binding polypeptide. Importantly, fusion takes place at the C-terminus of the biotinylated avidin binding polypeptide.

The key to each of the three rejections pending against the claims on appeal is the disclosure of Murtif. Murtif reports the results obtained from studies of how mutagenesis affects the carboxy terminus of the biotinyl subunit of transcarboxylase. Murtif determined that the carboxy terminus of the biotinyl subunit of transcarboxylase is very critical in biotination. For the reasons set forth beginning at page 8, line 4, of the Appeal Brief and continuing through the second line of page 10 of the document, we agree with appellants that Murtif teaches away from the claimed invention. As further evidence that at the time of the present invention, Murtif would have been viewed as teaching away from the claimed subject matter, we make reference to Cronan. Cronan describes fused polypeptides containing a polypeptide of interest fused to at least one biotinylated avidin binding polypeptide. However, the fusion in Cronan takes place at the N-terminus of the

biotinylated avidin polypeptide, not the C-terminus as required by the claims on appeal. When Cronan performed the reported studies, they were aware of the results reported in Murtif. See Cronan, paragraph bridging pages 10327-28. Viewed in this light, Cronan provides evidence that a person skilled in this art, having knowledge of the disclosure of Murtif, would have proceeded in a manner opposite that required by the claims on appeal.

In summary, we agree with appellants that the examiner's rejections are premised upon impermissible hindsight.

The decision of the examiner is reversed.

REVERSED

Appeal No. 94-2279  
Application 07/687,819

SHERMAN D. WINTERS  
Administrative Patent Judge

WILLIAM F. SMITH  
Administrative Patent Judge

ELIZABETH C. WEIMAR  
Administrative Patent Judge

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